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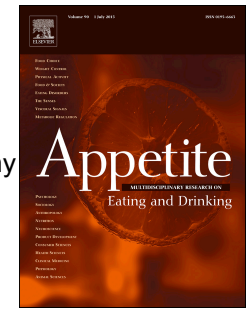

Does a 'protective' message reduce the impact of an advergame promoting unhealthy foods to children? An experimental study in Spain and the Netherlands

Frans Folkvord, Francisco Lupiáñez-Villanueva, Cristiano Codagnone, Francesco Bogliacino, Giuseppe Veltri, George Gaskell

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Running Head: 'Protective' message in a food advergame and snack intake

Authors: Frans Folkvord, PhD[1,2] , Francisco Lupiáñez-Villanueva, PhD [2] , Cristiano Codagnone, PhD [2,3] Francesco Bogliacino, PhD [4], Giuseppe Veltri, PhD [5], George Gaskell, PhD [6.]

Affiliations: [1] Behavioural Science Institute, Communication Science, Radboud University, Nijmegen, The Netherlands; [2] Information and Communication Science, Universitat Oberta de Catalunya, Barcelona, Spain.[3] Dipartimento di Scienze Sociali e Politiche, Universitá degli Studi di Milano, Milano, Italy.[4] Universidad Nacional de Colombia, Facultad de Ciencias Económicas, Bogotá, Colombia.[5] University of Trento, Department of Sociology and Social Research, Italy. [6]London School of Economics and Political Science, London, United Kingdom.

Address correspondence to: Frans Folkvord, Behavioural Science Institute, Radboud University Nijmegen, Thomas van Aquinostraat 2, 6526 GD Nijmegen, Netherlands. E-mail: f.folkvord@maw.ru.nl. Tel: +31 24 3615896. Fax: +31 24 361 3073.

Abstract

The weight of evidence points to the advertising of food affecting food consumption, especially among children. Such advertising often promotes unhealthy foods. Current policy deliberations focus on developing effective 'protective' messages to increase advertising literacy and consequent scepticism about advertising targeting children. This study examined whether incorporating a 'protective' message in an advergame promoting energy-dense snacks would reduce children's snack intake. A randomized between-subject design was conducted in the Netherlands (N = 215) and Spain (N = 382) with an advergame promoting either energy-dense snacks or nonfood products. The results showed that playing an advergame promoting energy-dense snacks increased caloric intake in both countries, irrespective of whether the 'protective' message was present or not. These results point to the limitations of 'protective' messages and advertising literacy and provide policy makers with a rationale for extending the current prohibition of food advertising to young children in the terrestrial media to online environments.

Key Words: food advertisements; protective message; food intake; childhood obesity.

Introduction

Childhood obesity is a major public health priority worldwide (WHO, 2016). A central issue in understanding the environmental impact on the obesity epidemic is the influence of industry-developed food cues on eating behaviour (Brownell & Gold, 2013). In an "obesogenic" society, characterized by an abundance of highly palatable food items and the presence of food-related cues, children are frequently exposed to attractive food and food-related cues (Wardle, Carnell, Haworth, & Plomin, 2008; Zhong & DeVoe, 2010). More specifically, food advertisements promoting energy-dense snacks that are high in salt, sugar and fat and low in nutritional value are ubiquitous. They are designed to attract attention and influence children's consumer behaviours (Harris, Speers, Schwartz, & Brownell, 2012).

Research shows that children are susceptible to food advertisements (Boyland et al., 2016; Cairns, Angus, Hastings & Caraher, 2013; Folkvord, Anschutz, Boyland, Kelly, & Buijzen, 2016). New forms of advertising such as online digital games, so-called advergames, are designed to advertise a product or a brand, integrating the commercial food cues with media content (Buijzen, Van Reijmersdal, & Owen, 2010). Children process these embedded food cues with a minimal level of cognitive elaboration (Buijzen, Van Reijmersdal, & Owen, 2010; Cauberghe & De Pelsmacker, 2010, 2013; Folkvord et al., 2016; Nairn & Hang, 2012; Terlutter & Capella, 2013), making it more difficult to initiate consumer defences such as persuasion knowledge and scepticism (Folkvord et al., 2016).

A recent theoretical model, The Reactivity to Embedded Food Cues in Advertising Model (REFCAM), suggests that through classical conditioning, substance-related cues elicit the expectancy of substance availability, and this expectancy causes subjective craving leading to energy-dense snack intake (Folkvord et al., 2016). A main proposition of the REFCAM is that the level of processing of embedded food cues in advertisements influences the effect of the food cues (Folkvord et al., 2016). Several studies have shown that televised

food advertisements, which involve relatively high awareness and elaboration, have a relative small effect on food intake (Anschütz et al., 2009; Boyland & Halford, 2013; Halford et al., 2008; Halford et al., 2004). However, recent studies examining the effect of food cues integrated in advergames show a stronger effect on food intake (Folkvord et al., 2013; 2014; 2015; Harris et al., 2009; Pempek & Calvert, 2009). The REFCAM suggests that in high elaboration scenarios, there is insufficient available cognitive capacity to activate scepticism regarding the intention of the commercial message, inducing physiological and psychological reactivity that motivates eating behaviour (Folkvord et al., 2016). A message that increases awareness of the advertisement might mitigate the effect of the food advertisements on subsequent intake (Boerman, Van Reijmersdal, & Nijens, 2012, 2015).

There is a growing literature examining whether increasing children's advertising literacy increases scepticism about marketing (Ali et al., 2013, Raney et al., 2003, Rozendaal et al, 2010, Rozendaal, Lapierre, Van Reijmersdal, & Buijzen, 2012, Rozendaal, Buijzen, & Valkenburg, 2011). The evidence of a link between advertising literacy and susceptibility to food advertisements is mixed. Some studies have shown no effect of advertising literacy on the susceptibility to food advertising (Rozendaal et al, 2010; Rozendaal, Lapierre, Van Reijmersdal, & Buijzen, 2012). Other studies suggest that literacy levels differ by age and the effects of food advertising might be dependent on advertising literacy (Livingstone & Helsper, 2006). In particular, Rozendaal et al. (2009, 2010, 2012) have shown that 8 year old children start developing cognitive advertising defences. These defences increase progressively to the age of 12 years with a significant increase around the age of 10. Including a message in an advergame promoting energy-dense snacks could encourage children's scepticism about the advertisement and decrease the cue-reactivity to food cues (Livingstone & Helsper, 2006; Rozendaal et al., 2010; Rozendaal, Lapierre, Van Reijmersdal, & Buijzen, 2012). Essentially, this is the main research question of the current study. Would

a proposed protective message[1], hereafter 'protective' message, reduce the effect of an advergame promoting energy-dense snacks on children's food consumption?

We expect that children who play an advergame promoting energy-dense snacks will eat more snacks than children who play an advergame promoting a nonfood product (hypothesis 1). In addition, we expect an interaction between type of advergame and the 'protective' message. Children who play an advergame promoting energy-dense snacks with a 'protective' message will eat less snacks than children who play an advergame promoting energy-dense snacks without a 'protective' message, while we expect no difference in snack intake among children who play an advergame promoting a nonfood product (hypothesis 2). Finally, we expect that the effect of the 'protective' message will be effective among children older than 8 years, and we expect no effect of the 'protective' message among children younger than 8 years (hypothesis 3).

Method

Experimental design and stimulus materials

We used a factorial between-subjects design comprising 2 types of advergame (energy-dense snacks vs. nonfood products) by 2 'protective' messages (present vs. absent). The dependent variable was caloric intake. During the advergame playing, children were presented with two bowls of energy-dense snacks; (1) jelly candy (cola bottles) and (2) milk chocolate candy shells. The jelly candy cola bottles were identical to the food products shown in the advergame promoting energy-dense snacks. Non-advertised milk chocolate candy shells were also presented because previous studies have shown that food advertising has an unintended

[1] A 'protective' message is an on-screen sentence informing the game player of the advertising intent of the game. At the policy level in Europe, this type of message has been proposed to fight obesity in children. Since this study is part of a large study for the European Commission, the research questions were framed to inform the policy discussion.

spill-over effect to other food products (Folkvord et al., 2013, 2014). Children were told that they could eat freely from the bowls.

The children participating in the study were randomly allocated to 1 of 4 conditions. There involved (1) playing the energy-dense snacks advergame (i.e., promoting a popular candy brand and 8 different gummy and jelly sweets from this popular candy brand) with or (2) without the 'protective' message; (3) playing the nonfood advergame (i.e., promoting a popular Dutch toy brand and 8 individual toys from this brand) with or (4) without the 'protective' message.

A professional designer created the advergames. The two games (promoting energy-dense snacks or nonfood products) were identical, except for the advertised brands and products. The game involved a memory task with 16 cards; the brands appeared on the back of the cards, and the individual products (candy or toys) appeared on the front of the cards. As is typical in advergames, we integrated two specific features to immerse the children into the game. First, a digital timer appeared on the top-left of the screen, and a time bar appeared in the top-centre of the screen to exert time pressure on the children. Second, the game made an unpleasant sound when the child selected a false pair and a pleasant sound when the child selected a correct pair.

The sample size used in this study (respectively 215 children in the Netherlands and 382 children in Spain) was appropriate according to a G*power analyses (Faul, Erdfelder, Lang, & Buchner, 2007). With a large-size effect of Cohen's $f = 0.40$ (based on the study from Folkvord et al., 2013, who used identical stimulus materials and procedures as this study), alpha level set at .05 and a power of .80, the total number of participants should be set at a minimum of 112.

Procedure

The experimenter collected one child at a time from the classroom listed in alphabetical name order by the school teacher. The experimenter took the child to another classroom or office containing a computer running one of the advergames.

The session started with a short questionnaire eliciting gender, age, group, and hunger level (masked with filler questions about energy, excitement and thirst levels). Next, children played one of the advergames with or without the 'protective' message. The 'protective' message was a line of text that was prominently visible, in the centre in the upper part of the screen, which stated: "*Remember: This game is an advertisement for 'X'.*". Multiple studies (Boerman, Van Reijmersdal, & Neijens, 2012, 2014; Rozendaal, Buijzen, & Valkenburg, 2009, 2011) have shown that a message that discloses sponsorship enhances the recognition of sponsored television content, leading to an increase in critical processing of the content among 10-12 year old children and a reduced product desire (Rozendaal et al., 2009, 2011). For the advergame promoting energy-dense snacks 'X' was a popular candy brand, and for the advergame promoting nonfood products 'X' was a popular toy brand. The experimenter read the instructions from the screen, which stated that the child would be playing a memory game for five minutes and should attempt to finish as many games as possible (there was no limit). All children played the advergame for five minutes. Comparable studies (Folkvord et al., 2013; 2014; 2015) used the same amount of time.

While playing, children could eat *ad libitum* from two bowls filled with food containing energy-dense snacks. One bowl contained the advertised energy-dense snack and the other contained a new form of energy-dense snack. The experimenter left the room when the children played the advergame. After each session, the experimenter weighed the bowls to calculate caloric intake. The experimenter refilled and weighed the bowls before the next

child entered the room to make sure that the children did not notice how much the previous child had eaten.

After the children finished the game they filled in the second part of the questionnaire together with the experimenter, who also measured their weight and height (without shoes). The second part of the questionnaire contained questions on brands, products and on persuasion knowledge (conceptual and attitudinal). Children who played the game with the 'protective' message were asked two extra questions to check if they remembered and/or had recognized the 'protective' message.

The causal relations between the type of advergame and food intake were analysed using separate univariate analyses of covariance (ANCOVA) for the Dutch and the Spanish children. In addition, univariate analyses of covariance tested for age-group differences. One-tailed were used as the hypotheses specified the direction of the effects. Post hoc Bonferroni tests were conducted to examine the differences between the advergames. To correct for the multiple comparisons, we use Bonferroni adjusted significance levels. The one-sided adjusted p -value that was considered significant was .05. We calculated effect sizes for Cohen's f and Cohen's d.

Results

Descriptives

Children (N = 597) were individually tested in the Netherlands (n = 215) and in Spain (n = 382), at school during regular school hours. We excluded four Dutch children on account of Ramadan, or because they had food in their pockets during the experiment, and one child was excluded from the analyses because of partial non-response. Thirty one Spanish children were excluded from the analyses because they had not finished the session completely, did not understand the experimental procedure, or had outlying scores on snack consumption (M + 2.5*SD). Conducting the separate analyses with or without the outlying scores did not affect

the results significantly. The final sample consisted of 211 Dutch children (between 6 and 11 years) and 351 Spanish children (between 6 and 12 years old).

In the Netherlands, the mean (± *SD*) age of the children was 9.0 ± 1.18 years, 49.3% were girls. In Spain, the mean (± *SD*) age of the children was 8.9 ± 1.68 years, 52.9 % were girls. Of the Dutch children, 7.1 % were underweight, 74.3% were normal weight, 13.3% were overweight, and 5.2% were obese. Of the Spanish children, 18.5% were underweight, 65.5% were normal weight, 11.1% were overweight, and 3.7% were obese. Children liked both advergames equally and no differences were found between the children who played the different advergames on attitudes to the advertised energy-dense snack brand or advertised snacks products. Furthermore, we found no differences on brand recognition. In Table 1 and 2 we show the variables measured by condition, separately for the Dutch and Spanish children.

Correlations with total snack intake were calculated to determine possible covariates. Different correlations were found between the two countries, which led us to decide to use separate tests for the two countries. The same covariates were added to the models in both countries, to make possible the comparisons between countries. Covariates that were included in the analyses were gender ($r_{Dutch\ children}$ = -0.124, p = 0.072, $r_{Spanish\ children}$ = -0.218, p = 0.000) and hunger ($r_{Dutch\ children}$ = 0.098, p = 0.158, $r_{Spanish\ children}$ = -0.218, p = 0.000). Body mass index (BMI), game attitude, and advertisement literacy were not correlated with total snack intake in either country ($p < 0.05$).

Table 1

Variables measured by the condition: Dutch sample[1]

	Energy-dense advergame (n = 52)	Energy-dense advergame with PM[2] (n = 55)	Nonfood advergame (n = 52)	Nonfood advergame with PM[2] (n = 52)
Sex (boy)	50 %	50.9 %	42.3 %	59.6 %
Hunger (cm on VAS)	4.6 ± 4.2	4.3 ± 4.1	3.3 ± 3.4	4.8 ± 4.8
BMI	17.2 ± 3.0	17.5 ± 2.8	17.9 ± 3.0	17.3 ± 2.8
Age (y)	8.9 ± 0.9	9.2 ± 1.1	9.1 ± 1.2	8.8 ± 1.3
Attitude to the game	9.7 ± 2.4	9.7 ± 2.6	10.1 ± 2.0	9.8 ± 2.3
Attitude to the candy brand	10.7 ± 2.4	10.4 ± 2.4	10.7 ± 2.2	9.8 ± 3.0
Total calorie intake (kcal)	182.4 ± 137.0	206.6 ± 146.9	90.3 ± 129.1	81.0 ± 101.4
Jelly cola bottles intake (kcal)	95.5 ± 83.3	86.3 ± 105.0	35.9 ± 50.8	40.2 ± 59.2
Milk chocolate candy shells intake (kcal)	86.9 ± 100.9	120.2 ± 123.2	54.3 ± 112.9	40.7 ± 68.9
Remembering PM (yes)	n.a.	5 %	n.a.	6 %
Recognizing PM (yes)	n.a.	40 %	n.a.	33 %

[1] n = 211

[2] PM= Protective message

Table 2

Variables measured by the condition: Spanish sample[1]

	Energy-dense advergame (n = 83)	Energy-dense advergame with PM (n = 90)	Nonfood advergame (n = 88)	Nonfood advergame with PM (n = 90)
Sex (boy)	50.6 %	45.6 %	44.3 %	44.3 %
Hunger (cm on VAS)	7.6 ± 4.5	7.8 ± 4.9	7.4 ± 4.7	7.4 ± 4.8
BMI	16.4 ± 2.4	17.0 ± 3.5	16.7 ± 3.0	16.3 ± 2.8
Age (y)	8.9 ± 1.7	8.8 ± 1.6	8.9 ± 1.7	8.9 ± 1.7
Attitude to the game	12.2 ± 2.2	12.2 ± 2.2	12.1 ± 2.2	11.7 ± 2.5
Attitude to the candy brand	11.7 ± 2.3	11.7 ± 2.5	11.5 ± 2.3	11.4 ± 2.5
Total calorie intake (kcal)	149.5 ± 121.8	166.9 ± 132.0	150.3 ± 124.2	149.9 ± 118.4
Jelly cola bottles intake (kcal)	88.8 ± 87.4	97.8 ± 108.6	90.8 ± 94.9	100.0 ± 94.2
Milk chocolate candy shells intake (kcal)	60.7 ± 73.7	69.2 ± 79.3	59.5 ± 81.8	49.9 ± 62.2
Remembering PM (yes)	n.a.	4 %	n.a.	1%
Recognizing PM (yes)	n.a.	31 %	n.a.	39 %

[1] n = 351

Main analyses

The results of the first ANCOVA showed that type of advergame influenced total snack intake among Dutch children, F (1, 103) = 9.847, p = 0.001, Cohen's d = 0.69, but not among Spanish children, F (1, 170) = 0.061, p = 0.417. Dutch children who played the advergame promoting energy-dense snacks (M = 182.43, SD = 137.0) ate significantly more energy-dense snacks than children who played the advergame promoting nonfood products (M = 90.27, SD = 129.1). The results from the second ANCOVA showed that the interaction effect between type of advergame and 'protective' message was not significant on total snack intake among children in the Netherlands, F (1, 210) = 1.556, p = 0.107, and not among children in Spain, F (1, 346) = 0.439, p = 0.254.

In addition, separate ANCOVAs were conducted to examine the effects of advergames between age-groups, see Figure 1. For the Dutch children between 6 and 8 years, we found that type of advergame had an effect on total snack intake, F (1, 37) = 5.756, p = 0.011, Cohen's d = 0.79. The same was found for the children between 9 and 11 years, F(1, 64) = 3.732, p = 0.029, Cohen's d = 0.66. Children in both age groups who played the advergame promoting energy-dense snacks ate more than the children who played the advergame promoting nonfood products (see Figure 1).

Additionally, among Dutch children between 6 and 8 years, we found an interaction between type of advergame and the 'protective' message on total snack intake, F (1,75) = 3.418, p = 0.035. For the children between 9 and 11 the interaction between type of advergame and the 'protective' message had no significant effect on total snack intake, F (1,133) = 0.285, p = 0.297. Post hoc Bonferroni tests showed that Dutch children between 6 and 8 years old who played the advergame promoting energy-dense snacks without the 'protective' message ate significantly less (p = 0.015, Cohen's d = 0.58) than the children who played the advergame promoting energy-dense snacks with the 'protective' message. The

children who played the advergame promoting nonfood products without the 'protective'message ate almost the same amount (p = 0.399) as children who played the advergame promoting nonfood products with the 'protective' message.

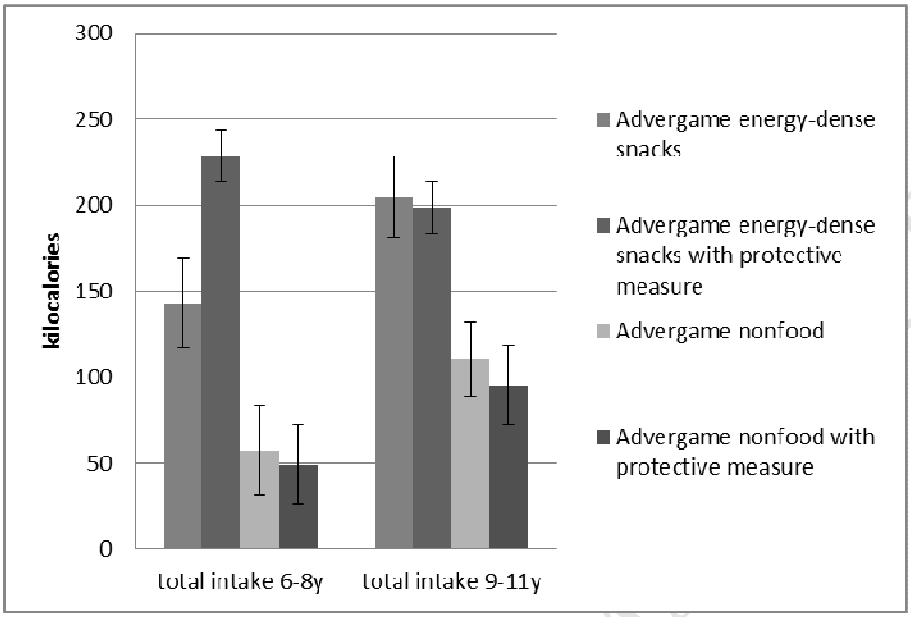

Figure 1. Mean snack intake in kilocalories of Dutch children as a function of type of advergame and age groups. Error bars = *SE*.

For the Spanish children between 6 and 8 years, we found that type of advergame had no statistically significant effect on total snack intake, F (1, 94) = 1.998, $p > 0.05$. For the children between 9 and 12 we found that type of advergame had a significant effect on total snack intake, F (1,75) = 5.297, p = 0.012, Cohen's d = 0.51. Spanish children between 9 and 12 years old who played the advergame promoting energy-dense snacks ate more of the energy-dense snacks than children who played the nonfood advergame (see Figure 2).

For the Spanish children between 6 and 8 years, we found that the interaction between type of advergame and the 'protective' message on total snack intake was significant, F (1,158) = 3.032, p = 0.042. For children between 9 and 12 we found that the interaction had no significant effect on total snack intake, F (1,190) = 0.023, p = 0.440. Post hoc Bonferroni tests showed that Spanish children between 6 and 8 years old who played the advergame

promoting energy-dense snacks without the 'protective' message ate significantly ($p = 0.020$, Cohen's $d = 0.43$) less than children who played the advergame promoting energy-dense snacks with the 'protective' message, while the children who played the advergame promoting nonfood products without the 'protective' message ate the same amount ($p = 0.240$) than children who played the advergame promoting nonfood products with the 'protective' message.

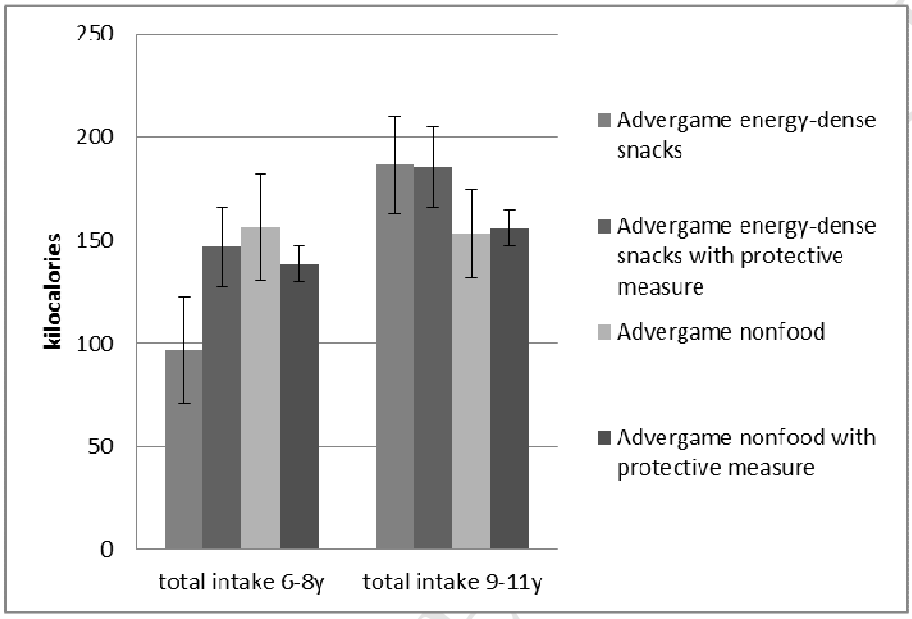

Figure 2. Mean snack intake in kilocalories of Spanish children as a function of type of advergame and age groups. Error bars = *SE*.

Final, we found no significant differences in either country between the four conditions on attitude to the advergame ($p > .05$), attitude to the brand ($p > .05$), and attitude to the product ($p > .05$), or on brand recognition ($p > .05$).

Discussion and Conclusions

This study examined whether including a 'protective' message in an advergame promoting energy-dense snacks would reduce the effect of food advertising on children's snack intake. The results showed that advergames promoting energy-dense snacks increased the snack consumption among Dutch and older Spanish children, which supports the first hypothesis

and is in line with earlier findings and the REFCAM (Folkvord et al., 2013, 2014, 2015, 2016; Harris et al., 2012; Pempek & Calvert, 2009). More importantly, the results showed that including a 'protective' message in an advergame promoting energy-dense snacks was not effective in reducing calorie intake in either the Dutch or Spanish children as a whole or in the younger or older groups of children. These findings refute the second and third hypotheses. Young Dutch and Spanish children ate more of the energy-dense snacks when a 'protective' message was included in the advergame promoting energy-dense snacks, which contrasts with our expectations.

Remarkably, only 5% of the Dutch children and 4% of the Spanish children who played the energy-dense advergame with the 'protective' message remembered the text of the 'protective' message. In addition, only 40% of the Dutch children and 31% of the Spanish children who played the energy-dense advergame said that they recognized the text of the 'protective' message, and only 33 % of the Dutch children and 39 % of the Spanish children who played the non-food advergame said that they recognized the text of the 'protective' message. Multiple studies (Boerman, Van Reijmersdal, & Neijens, 2012, 2014; Rozendaal, Buijzen, & Valkenburg, 2009, 2011) have shown that a 'protective' message that discloses sponsorship enhances the recognition of sponsored television content, leading to an increase in critical processing of the advertised content. Recall and recognition of an advertisement, in this case the 'protective' message we used, is an important starting phase for critically processing the advertising content and acting upon it (Boerman et al., 2014; Rozendaal et al., 2009, 2011), which was not found in the current study. The 'protective' message was a sentence in the upper centre part of the screen that said: "*Remember: This game is an advertisement for X*.". Children who remembered the message said something like "*This game is an advertisement from X",* or "*This game is made by X"*. Most children, regardless of their age, answered simply "No, I have no idea" to the question. Separate analyses comparing

children who remembered the message and the children who did showed no differences on snack intake.

In addition, children who played the advergame promoting energy-dense with the 'protective' message did not have a different attitude to the game, brand, or products. Dutch children who recognized the 'protective' message in the advergame promoting energy-dense snacks reported more knowledge about the persuasive intent of the advergame than children who did not recognize the 'protective' message. Dutch children who recognized the 'protective' message in the advergame promoting energy-dense snacks reported more often that the game was designed to increase the liking of energy-dense snacks from the advertised brand and that the game was designed so that children would crave for the advertised energy-dense snacks compared to children who did not recognize the 'protective' message in the advergame promoting energy-dense snacks. This result suggests that some children became more aware of marketers' intentions, but no effects were found on food intake. This is in line with previous studies (Reijmersdal et al 2012; Panic et al. 2013) that concluded awareness of the persuasive attempt has little effect on children's behaviour after playing advergames and demonstrates the power of this form of advertising on children. For Spanish children we found no differences on advertisement literacy.

Remarkably, Dutch and Spanish children between 6 and 8 years ate more energy-dense snacks in total after playing the advergame promoting energy-dense snacks with the 'protective' message compared to children who played the advergame promoting energy-dense without the 'protective' message. One explanation for this finding is that the children who played the advergame promoting energy-dense snacks subconsciously processed the 'protective' message and reacted as if they were supposed to eat more of the energy-dense snacks after playing the game, because of the marketers intentions. In addition, children from both countries who said they recognized the 'protective' message did not eat less of the

energy-dense snacks. Is this an example of an unintended negative impact of a policy framed with the best of good intentions? Because we have not recorded eye-movements we do not know whether the children had seen the message; an issue to pursue in future research.

As the REFCAM proposes, children are focused on playing the game, and they may subconsciously and automatically process the food cues; even without noticing the 'protective' message (Folkvord et al., 2016). The positive effect that is associated with the entertaining aspect of playing the advergames is transferred to the brand outside conscious control; influencing children's food choices in the absence of any deliberation. Adding the 'protective' message to the advergame did not affect children's attitude to the advergame, the advertised brand or products. Children's cognitive resources are concentrated largely on the game and food cues thus become elaborated on an automatic level (Buijzen et al., 2010), directly leading to physiological and psychological reactions (Carter & Tiffany, 1999).

A strength of this study is the large number of children from two countries that participated in the study giving a robust test of the effects of both food promoting advergames and the inclusion of a 'protective' message on actual snack intake. A second strength is the use of a behavioural message – food intake. A third strength is that we assessed a number of possible confounding variables that it transpired did not affect our results, again highlighting the robustness of the findings. One limitation of this study is that children played the advergame for only five minutes. At home children can and do play for a longer periods of time. When children play the game more frequently, this could lead to even stronger effects of the advergame on caloric intake than observed in this study (Harris, Speers, Schwartz, & Brownell, 2012). Furthermore, although the children's reports of recall and recognition of the 'protective' message are consistent with their lack of processing of the message, but in the absence of a record of eye-movements we cannot be certain. Another limitation is that the availability of food that we presented in our study after playing an advergame is not totally

comparable with a naturalistic setting. In real life children might not have access to different types of snack foods from which they can freely eat. However, other studies have shown that the effects of playing a game containing food cues spills over to other kinds of foods than those promoted in the game (Folkvord et al., 2013, 2014), which suggests that children would eat more of other foods when available.

The current study adds to the wider literature in demonstrating that advergames are effective in stimulating the consumption of unhealthy foods (Folkvord et al., 2013, 2014, 2015, 2016; Harris et al., 2009; Pempek & Calvert, 2009). Equally, it has been established that persuasion knowledge alone does not reduce the effects of advergames, because children who played an energy-dense advergame and remembered or recognized the 'protective' message did not eat fewer snacks. In the light of these findings it is implausible to believe that it would be effective to implement protective messages in food advertisements (An & Stern, 2011; Panic et al., 2013; Rozendaal et al., 2011). Food cues in advergames may curb the effectiveness of this new form of food advertising, irrespective of the fact that children recognize the persuasive intent. Policy makers should take these findings into account in the development of policy options actions to reduce children's exposure to advertising and consumption of unhealthy foods.

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